

REMARKS

Applicants respectfully request a favorable reconsideration of the claims. Claims 1, 6, and 8 have been revised. The revisions are supported by, for example, Fig. 1, TABLE 1, page 2, line 2 to page 3, line 21, and pages 6-7 in the Specification. Claims 10-11 are new. Claim 10 is supported by, for example, TABLE 1, original claim 1, page 2, line 6 to page 3, line 17, and page 4, lines 3-8 in the Specification. Claim 11 is supported by, for example, page 2, line 6 to page 3, line 17, and page 4, lines 4-8 in the Specification. Claim 12 is supported by, for example, page 3, line 21 to page 4, line 8 in the Specification. There is no new matter. Claims 1-3 and 5-12 are pending.

Status of Claims

Item 1 of the Office Action stated that "claim 3 was cancelled." This is a typographical error. In the Amendment filed on June 18, 2008, claim 4 was canceled. Claim 3 was not canceled. Applicants respectfully request confirmation in the next official communication that claim 3 is not canceled.

Claim Rejections – 35 USC § 112

Claims 1-3 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Applicants do not concede the correctness of this rejection. To address this rejection, claim 1 has been revised, wherein "greater than 0.5 wt %" has been edited to "equal to or greater than 0.3 wt %." Revision to claim 1 is supported by the original claim 1, which originally claimed "equal to or greater than 0.3 wt %." There is no new matter. Applicants respectfully request that the rejection be withdrawn.

Claim Rejections – 35 USC § 103

Claims 1, 6, and 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Winkler (EP 918095 A1). Applicants do not concede the correctness of the rejection.

Regarding claim 1, the transitional phrase "consisting essentially of" in claim 1 limits the scope of the claim such that 0.05-0.4 wt.% scandium (Sc) disclosed in Winkler is not included. The disclosure of the present application provides for "a die-cast product having yet further improved toughness," wherein the improvement is achieved, not by mere additions of casting

materials, but “by the use of an Al-Mg casting alloy having a specified sum (Ti+Zr) of amounts of Ti and Zr added and a specified ratio (Ti/Zr) of the amounts of Ti and Zr added” (page 2, lines 2-5 in the Specification). Further, the disclosure of the present application does not mention Sc. None of the examples and embodiments in the present application includes Sc. Accordingly, the Applicants have excluded Sc in the amount disclosed in Winkler, because the amount of Sc disclosed in Winkler would materially affect the basic and novel characteristics of the alloy.

According to Winkler, the amount of Sc taught in Winkler materially affects the basic characteristics of an Al alloy. Winkler teaches that the “instant invention takes advantage of the finding that ... with an addition of scandium therefore the strength of the basic alloy can become by a precipitation hardening increased” (paragraph [0009], EPO translation). Thus, Winkler, itself, teaches that adding Sc materially affects the characteristics of an Al alloy. In contrast, the disclosure of the present application does not discuss forming an isomorphous phases Al_3Sc characterized as cubic face-centered superstructure phases in the aluminum matrix lattice.

So, like in *AK Steel Corp. v. Sollac*, the disclosure and the claims of the present application clearly indicate what the basic and novel characteristics actually are. See *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1240-41, 68 USPQ2d 1280, 1283-84 (Fed. Cir. 2003) (Applicant's statement in the specification that “silicon contents in the coating metal should not exceed about 0.5% by weight” along with a discussion of the deleterious effects of silicon provided basis to conclude that silicon in excess of 0.5% by weight would materially alter the basic and novel properties of the invention.) Thus, the transitional phrase “consisting essentially of” in claim 1 limits the scope of the claim such that 0.05-0.4 wt.% Sc disclosed in Winkler is excluded.

Further, Winkler includes Sc in all of the alloys taught in the reference. Further, Winkler teaches that Sc is necessary to achieve a special result of forming an isomorphous phases Al_3Sc that is a cubic face-centered superstructure in the matrix lattice. Winkler teaches “a structural component of a die cast aluminum alloy, which contains 0.05-0.4 wt.% Sc” (Abstract, EPO translation). Winkler teaches that the alloy according to his invention has “0.05-0.4 wt.% Sc” that is essential for forming the “isomorphous phases Al_3Sc and Al_3Zr , which are both characterized as cubic face-centered superstructure phases in the aluminum matrix lattice” (paragraph [0009], EPO translation). Accordingly, Winkler teaches that isomorphous phase Al_3Sc in the alloy advantageously increases the firmness of the alloy (see paragraph [0009]-[0010],

EPO translation) by forming “cubic face-centered superstructure” in the “aluminum matrix lattice” (paragraph [0009], EPO translation). Further, Winkler teaches that a minimum amount of scandium is 0.05 wt% in the alloy to achieve the stated advantageous results. Thus, the alloy according to the teachings in Winkler requires Sc in sufficient amount to form isomorphic phase Al_3Sc in the alloy. Accordingly, the statement that ‘scandium (Sc) is an essential element according to the teachings in Winkler’ is not a mere argument but rather the conclusion that one skilled in the art would understand from the teachings in Winkler. In contrast, claim 1 requires an Al-Mg casting alloy consisting essentially of $3.5 \text{ wt \%} \leq \text{Mg} \leq 4.5 \text{ wt \%}$, $0.8 \text{ wt \%} \leq \text{Mn} \leq 1.5 \text{ wt \%}$, $\text{Si} < 0.5 \text{ wt \%}$, $\text{Fe} < 0.5 \text{ wt \%}$, a sum $(\text{Ti} + \text{Zr})$ of the amounts of Ti and Zr added of equal to or greater than 0.3 wt %, and a ratio (Ti/Zr) of the amounts of Ti and Zr added of at least 0.3 but not more than 2, with the balance being Al. An alloy according to claim 1 does not include Sc in the amounts taught in Winkler. The essential element of the alloy in the amount according to Winkler is not included in claim 1. Thus, it would not have been obvious to one of ordinary skill in the art to take the teachings of Winkler and remove Sc, which Winkler teaches is required to achieve the benefits and advantages stated therein. Thus, for at least the above reasons, claim 1 is not obvious in view of Winkler. Applicants respectfully request a favorable reexamination of the claim.

Claim 6 requires an Al-Mg casting alloy consisting essentially of $3.5 \text{ wt \%} \leq \text{Mg} \leq 4.5 \text{ wt \%}$, $0.8 \text{ wt \%} \leq \text{Mn} \leq 1.5 \text{ wt \%}$, $\text{Si} < 0.5 \text{ wt \%}$, $\text{Fe} < 0.5 \text{ wt \%}$, $\text{Ti} > 0.2 \text{ wt \%}$, a sum $(\text{Ti} + \text{Zr})$ of the amounts of Ti and Zr added of equal to or greater than 0.3 wt %, and a ratio (Ti/Zr) of the amounts of Ti and Zr added of at least 0.3 but not more than 2, with the balance being Al. Accordingly, for at least the same reasons as claim 1, claim 6 is not obvious in view of Winkler. Applicants respectfully request a favorable reexamination of the claim.

Claim 8 requires an Al-Mg casting alloy consisting essentially of $3.5 \text{ wt \%} \leq \text{Mg} \leq 4.5 \text{ wt \%}$, $0.8 \text{ wt \%} \leq \text{Mn} \leq 1.5 \text{ wt \%}$, $\text{Si} < 0.5 \text{ wt \%}$, $\text{Fe} < 0.5 \text{ wt \%}$, $\text{Zr} > 0.3 \text{ wt \%}$, a sum $(\text{Ti} + \text{Zr})$ of the amounts of Ti and Zr added of greater than 0.3 wt %, and a ratio (Ti/Zr) of the amounts of Ti and Zr added of at least 0.3 but not more than 2, with the balance being Al. Accordingly, for at least the same reasons as claim 1, claim 8 is not obvious in view of Winkler. Applicants respectfully request a favorable reexamination of the claim.

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Winkler in further view of Komazaki (US 2002/0141896). Applicants do not concede the correctness of the rejection. Komazaki does not remedy the deficiencies of Winkler stated above in regard to claim 1. Claim 2 is patentable for at least the same reasons as claim 1 from which it depends. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

Claims 3, 5, 7, and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Winkler in further view of Spanjers et al. (US 2002/0006352 A1). Applicants do not concede the correctness of the rejection.

Spanjers et al. does not remedy the deficiencies of Winkler stated above in regard to claims 1, 6, and 8. Claims 3 and 5 are allowable for at least the same reasons as claim 1 from which they depend. Claim 7 is allowable for at least the same reasons as claim 6 from which it depends. Claim 9 is allowable for at least the same reasons as claim 8 from which it depends.

Further, Spanjers et al. teaches that zinc (Zn) is an essential alloying element. According to Spanjers et al., Zn materially affects the nature of the alloy by providing strength in the as-cast condition and the welded joints of the alloy. Spanjers et al. teaches that Zn below 0.10 % is considered an impurity element. Thus, according to Spanjers et al. Zn should be present in a range of 0.10 to 1.5 % to provide the advantageous strength improvement (see paragraphs [0042]-[0043]). In contrast, claims 1, 6, and 8 do not require Zn at a higher level than that is considered to be an impurity. It would not have been obvious to one of ordinary skill in the art to take the teachings of Spanjers et al. and remove an essential element that Spanjers et al. specifically teaches is required to achieve the benefits and advantages stated therein.

Further, Spanjers et al. teaches that "Sc level should not exceed 0.3%, and is preferably in a range of 0.05 to 0.2%" (paragraph [0045]). Accordingly, even if one of ordinary skill in the art were to be motivated to combine the teachings of Winkler and Spanjers et al., which Applicants do not concede that there is such a motivation, the resulting alloy from the combined teachings would include Sc and Zn as essential elements. Claims 3, 5, 7, and 9 do not include an alloy having Sc and Zn as essential elements. Accordingly, claims 3, 5, 7, and 9 are not obvious in view of Winkler and further in view of Spanjers et al. Applicants respectfully request a favorable reexamination and reconsideration of the claims.

Claim 10 requires an Al-Mg casting alloy, consisting of $3.5 \text{ wt } \% \leq \text{Mg} \leq 4.5 \text{ wt } \%$, $0.8 \text{ wt } \% \leq \text{Mn} \leq 1.5 \text{ wt } \%$, $\text{Si} < 0.5 \text{ wt } \%$, $\text{Fe} < 0.5 \text{ wt } \%$, and balance being Al and unavoidable impurities. Claim 10 does not include Sc in the amount that would be considered to be not an impurity. As stated above in regard to claim 1, Winkler teaches an alloy wherein "0.05-0.4 wt.% Sc" is essential for forming the "isomorphic phases Al_3Sc ..., which are ... characterized as cubic face-centered superstructure phases in the aluminum matrix lattice" (paragraph [0009], EPO translation). Accordingly, claim 10 is neither taught nor suggested by Winkler. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

Claim 11 requires an Al-Mg casting alloy consisting of $3.5 \text{ wt } \% \leq \text{Mg} \leq 4.5 \text{ wt } \%$, $0.8 \text{ wt } \% \leq \text{Mn} \leq 1.5 \text{ wt } \%$, $\text{Si} < 0.5 \text{ wt } \%$, $\text{Fe} < 0.5 \text{ wt } \%$, $\text{Ti} > 0.2 \text{ wt } \%$, wherein a sum ($\text{Ti} + \text{Zr}$) of the amounts of Ti and Zr added of equal to or greater than 0.3 wt %, and a ratio (Ti/Zr) of the amounts of Ti and Zr added of at least 0.3 but not more than 2, and balance being Al and unavoidable impurities. Claim 11 does not include Sc in the amount that would be considered to be not an impurity. Accordingly, claim 11 is neither taught nor suggested by Winkler. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

Claim 12 requires an Al-Mg casting alloy consisting of $3.5 \text{ wt } \% \leq \text{Mg} \leq 4.5 \text{ wt } \%$, $0.8 \text{ wt } \% \leq \text{Mn} \leq 1.5 \text{ wt } \%$, $\text{Si} < 0.5 \text{ wt } \%$, $\text{Fe} < 0.5 \text{ wt } \%$, $\text{Zr} > 0.3 \text{ wt } \%$, wherein a sum ($\text{Ti} + \text{Zr}$) of the amounts of Ti and Zr added of greater than 0.3 wt %, and a ratio (Ti/Zr) of the amounts of Ti and Zr added of at least 0.3 but not more than 2, and balance being Al and unavoidable impurities. Claim 12 does not include Sc in the amount that would be considered to be not an impurity. Accordingly, claim 12 is neither taught nor suggested by Winkler. Applicants respectfully request a favorable reexamination and reconsideration of the claim.

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In view of the above, it is submitted that the application is in condition for allowance. Reconsideration and reexamination are requested. Allowance of the claims at an early date is solicited. Any questions regarding this communication can be directed to the undersigned attorney, Curtis B. Hamre, Reg. 29,165, at (612) 455-3802.



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Respectfully submitted,

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By:

A handwritten signature in dark ink, appearing to read "Curtis B. Hamre". The signature is written over a horizontal line.

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